

Christyl Johnson

“Celebrating NASA’s Legacy of Innovation: Addressing the Global Challenge”

September 12, 2006

It is truly my pleasure to be here with you today to share with you NASA’s legacy of innovation. The National Aeronautics and Space Agency (NASA) has a long history of advanced science in space exploration and research. The agency originally focused on developing technologies for satellite communications, intelligence and protecting the national security of the United States. In a remarkable speech at Rice University 40 years ago today, September 12, 1962, President John F. Kennedy outlined his vision for putting a “man on the moon” within the decade. This raised the status of NASA from an agency of hobbyists to a serious scientific achievement of inventing technologies. We made that vision a reality and engaged the whole nation in the excitement of that victory. In 2004, President Bush gave our nation a new Vision for Exploration, which tasked NASA with the responsibility to return to the moon and then to Mars and beyond. We fully understand that this is a very challenging mission. In order achieve this, NASA and all its partners will need some really smart, creative and innovative engineers, scientists, program analysts, and other team members. The engineers of the Apollo era that accomplished that major feat are gone now, so this legacy of innovation must be carried on by our future pipeline explorers. The global economy, national security concerns, and our own ambitious “Vision for Space Exploration” demand a new generation of people skilled in the technical fields. It requires that we improve the caliber of instruction in these critical fields and continue to cultivate a culture of excellence. After all, NASA couldn’t have expanded humankind’s understanding of the universe, advanced air travel safety and security, and expanded the frontiers of scientific research without education.

And make no mistake, without education, we can neither carry on our tradition of innovation nor compete with others who are accelerating the pace of innovation through their aggressive investment in technology.

That's why we're here today. We need to strengthen our partnerships with industry, non-profit organizations, academia, and other government agencies and develop systems that identify educational issues and expand educational programs that work.

So that's what we need..... but let's do a reality check here..... In 1983, the Department of Education released its watershed report, "A Nation At Risk." This report directly addressed space exploration by stating, and let me quote: "Our Nation is at risk ...the educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and as a people.... We have even squandered the gains in student achievement made in the wake of the Sputnik challenges.... We have, in effect, been committing an act of unthinking, unilateral educational disarmament." This report was really aimed at renewing the nation's commitment to schools across our land.

Since 1983, many other blue-ribbon panels have issued reports, prompting more reforms in education. In January of 2002, for example, the Bush Administration launched the "No Child Left Behind" initiative aimed at improving and strengthening K-12 instruction and curriculum. Just last year, the Senate Committee on Science, Engineering, and Public Policy received the findings of another study that said, and again I quote: "Without a

renewed effort to bolster the foundations of our competitiveness, we can expect to lose our privileged position” as a leader in technological innovation. That report, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*, prompted the American Competitiveness Initiative, which is expected to affect future legislation and federal agencies involved in science, technology, engineering, and mathematics disciplines. The centerpiece of this initiative is to increase federal investment in basic research and maintain an adequate flow of educational programs that recruit and retain students in technical majors at the undergraduate and graduate levels. As you will hear today, NASA has invested in many pipeline programs ranging from elementary Explorers Schools to our graduate student research program.

We as a nation have some serious work to do. However, despite the perceived weaknesses in American education, NASA has continued to invest in this area. We launched the Hubble Space Telescope, the Cassini/Huygens probe; we discovered that water once existed on Mars and we discovered the true age of the universe. Since 1983, NASA’s work in materials science has led to the creation of the “Jaws of Life.” This lightweight cutter is used to free accident victims. NASA’s innovations also have resulted in more effective protective helmets used by the NFL and the construction industry, tennis rackets, golf clubs, and roofing materials. Dental braces, rechargeable batteries, cardiac-monitoring equipment, global communication systems, wireless telephones, satellite television, and even computer bar codes were all made possible by NASA’s innovation.

And did you know that fewer and fewer people now need eyeglasses or contact lenses thanks to laser surgery performed by an instrument again made possible by NASA research? Did you know that Adam Kissiah, who formerly worked at NASA's Kennedy Space Center, has restored hearing for thousands of people and allowed thousands of others who were born deaf to perceive sound for the very first time? Using technology made for the Apollo and Space Shuttle systems, he invented the cochlear implant.

NASA innovations are even found in the "Personal Cabin Press Altitude Monitor and Warning System, the winner of the Commercial Invention of the Year. This device alerts pilots to slow, yet significant, leaks in pressurized cabins or cockpits, which causes crewmembers and passengers to fall asleep or become incapacitated. The device is now being used by the aircraft industry, mountain climbers, and in laboratories for carbon monoxide and carbon dioxide monitoring.

Even heart patients are benefiting from our technological innovation. NASA's Johnson Space Center in Houston, Texas, teamed up with doctors at the Baylor College of Medicine to design a device that pumps blood throughout the body to keep critically ill patients alive until a donor heart is available. You may have heard of the MicroMed DeBakey ventricular assist device.

Indeed, NASA-developed technologies have revolutionized and improved our daily lives. In the past 30 years, NASA alone has accounted for 8 percent of the world's scientific discoveries.

For the past 45 years, NASA's technological achievements have affected virtually every field of endeavor and every technical discipline. NASA's patents represent one out of every 1,000 patents issued since 1790. In 2005 alone, NASA's system for acquiring and protecting our intellectual property reported 1,735 inventions, nearly five per calendar day.

In addition, for every dollar the U.S. spends on the space program, it receives \$7 back in the form of corporate and personal income taxes from increased jobs and economic growth.

Now it's time to focus on how to continue this tradition of innovation. As I've already mentioned, the nation faces a critical shortage of people who can carry on where NASA's pioneers began nearly 50 years ago. That's why we're holding this meeting; that's why we're reaching out to you. That's why NASA invests in education and reaches out into the community to offer compelling opportunities that keep the pipeline filled with promising new talent — people who will serve as our next-generation space explorers. Our very survival depends on it. Without a skilled workforce, we can't carry out our mission and America can't maintain her technological edge.

It's that simple.

Over the next few hours, you'll learn about our Education Framework and some of the programs we've put in place to assure our technological future. You'll learn of our collaborations, and I hope, you'll think of ways where we can further leverage our resources. Although we're proud of our accomplishments and the accolades our programs have received, clearly our work is not done. We have a big job ahead us. So I challenge you to join us in our quest to raise the scientific and technical literacy of our young people — for the good of the country and ourselves. We can't do it alone. Together, we can and MUST fill the pipeline with students who will pick up where we leave off in our exploration of the vast cosmos that surrounds us.

Thank you.